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Geometric interpretations and questions arise throughout multivariable calculus, with many students identifying their struggle with visual reasoning as a potential roadblock to success in the course. At the University of Connecticut, a series of Play-Doh modeling activities has been developed to give students hands-on experience with various geometric objects and concepts in multivariable calculus. These activities were developed and implemented in Fall 2016 and are now in their second iteration. We will discuss the development and use of Play-Doh activities across three semesters. We will present preliminary results that compare students' self efficacy on the use of Play-Doh for visual understanding of multivariable calculus concepts to the performance of students in some specific guided assessments. We will also look for differences in the perception and performance of students between classes where Play-Doh was used with guided instruction and where very limited instructions were offered on the use of Play-Doh. (Received September 23, 2017)